

Outline

- I. What is ecology?
- II. Why study ecology?
- III. How to study ecology?
 - Where to study ecology?

I. What is ecology? (

Origin of word: *oikos* = the family household *logy* = the study of

Interesting parallel to *economy* = management of the household many principles in common – resources allocation, cost-benefit ratios

Definitions:

Haeckel (German zoologist) 1870:

“By ecology we mean the body of knowledge concerning the economy of Nature - the investigation of the total relations of the animal to its inorganic and organic environment.”

Burdon-Sanderson (1890s): Elevated Ecology to one of the three natural divisions of Biology: Physiology - Morphology – Ecology

Andrewartha (1961): “The scientific study of the distribution and abundance of organisms.”

Odum (1963): “The structure and function of Nature.”

The goal of ecology is to understand the principles of operation of natural systems and to predict their responses to change.

What ecology is not

Ecology is not environmentalism, nor “deep ecology.” Ecology is science, based on biological, physical and chemical principles, and should be value-free. Environmentalism advocates for certain actions and policy positions.

Why study ecology?

Curiosity – How does the world around us work? How are we shaped by our surroundings?

Responsibility – How do our actions change our environment? How do we minimize the detrimental effects of our actions?

Overfishing, habitat destruction, loss of biodiversity, climate change.

Nature as a guide – The living world has been around much longer than we have and has solved many problems with creative solutions. Ecological systems are models for sustainability. How can we feed our growing population? Where will we live?

Sustainability – a property of human society in which ecosystems (including humans) are managed such that the conditions supporting present day life on earth can continue.

Ecology helps us understand complex problems. Examples: Cane toads in Australia Feral pigs in Hawai'i Nile Perch in Lake Victoria Wolves in Yellowstone

Organisation of Matter

Atom

Molecule

Organelle

Tissues

Organism

Population: Group of interacting and interbreeding organisms

Ecosystem Organisms and their physical and chemical environments together in a particular area.

“The smallest units that can sustain life in isolation from all but atmospheric surroundings.”

Biome: Large scale areas of similar vegetation and climatic characteristics.

Biosphere: Thin film on the surface of the Earth in which all life exists, the union of all of the ecosystems. This is a highly ordered system, held together by the energy of the sun.

Organisation of Matter

Atom

Molecule

Organelle

Tissues

Organism

Population: Group of interacting and interbreeding organisms

Ecosystem Organisms and their physical and chemical environments together in a particular area.

“The smallest units that can sustain life in isolation from all but atmospheric surroundings.”

Biome: Large scale areas of similar vegetation and climatic characteristics.

Biosphere: Thin film on the surface of the Earth in which all life exists, the union of all of the ecosystems. This is a highly ordered system, held together by the energy of the sun.

Organisation of Matter

Atom

Molecule

Organelle

Tissues

Organism

Population: Group of interacting and interbreeding organisms

Ecosystem Organisms and their physical and chemical environments together in a particular area.

“The smallest units that can sustain life in isolation from all but atmospheric surroundings.”

Biome: Large scale areas of similar vegetation and climatic characteristics.

Biosphere: Thin film on the surface of the Earth in which all life exists, the union of all of the ecosystems. This is a highly ordered system, held together by the energy of the sun.